



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,122	03/25/2004	Peter Gregorius	1406/146/2	7700
25297	7590	10/04/2007	EXAMINER	
JENKINS, WILSON, TAYLOR & HUNT, P. A. 3100 TOWER BLVD., Suite 1200 DURHAM, NC 27707			SINGH, HIRDEPAL	
		ART UNIT	PAPER NUMBER	
		2611		
		MAIL DATE	DELIVERY MODE	
		10/04/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/809,122	GREGORIUS ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Hirdepal Singh	2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 25 March 2004.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) \_\_\_\_\_ is/are rejected.
- 7) Claim(s) 1-31 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 25 March 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachments(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 11/17/2005.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

1. This action is in response to the preliminary amendment filed on March 25, 2004. Claim 1-31 are pending and have been considered below.

### ***Specification***

2. The abstract of the disclosure is objected to because the abstract is not in compliance with the rules set forth in the MPEP, as the present abstract contains more than 25 lines or 150 words. Correction is required. See MPEP § 608.01(b).

### ***Claim Objections***

3. Claims 1-31 are objected to because of the following informalities:
4. Claim 1, limitation a(3) "an oversampling unit for oversampling the received data stream..", as applicant seems to be refereeing back to "received data bit stream", examiner suggests to change it to "an oversampling unit for oversampling the received data bit stream.."

Claim 1, limitation (a4) "a serial-to-parallel-conversion unit which converts the oversampled data stream into a deserialized data stream with a predetermined decimation factor", please change it as "a serial-to-parallel-conversion unit which

converts the oversampled data bit stream into a deserialized data bit stream with a predetermined decimation factor".

Claim 1, limitation (a5) "... a phase detector gain depending on the actual data density of the deserialized data stream such that ...", change it to "... a phase detector gain depending on an actual data density of the deserialized data bit stream such that ..."

Claim 1, limitation (b) "data recognition means for recovery of the received data stream which includes ...", examiner suggest to change it to "data recognition means for recovery of the received data bit stream which includes ..."

Claim 2 recites a limitation "means for detecting the actual data density of the parallelised data bit stream..." applicant seems to be referring back to "deserialized data bit stream" therefore it need to be changed as "means for detecting the actual data density of the deserialized data bit stream..."

Claim 10 "The clock and data recovery unit according to claim 1 wherein the data transmission rate..." this is the first time applicant is referring to a data transmission rate in the chain of claims so it needs to be changed to "The clock and data recovery unit according to claim 1 wherein a data transmission rate..."

Claim 18 "...the phase interpolation unit comprises a phase interpolator and a multiplexer for rotating the phase signals in response to the rotation control signal." change it to "...the phase interpolation unit comprises a phase interpolator and a multiplexer for rotating the reference phase signals in response to the rotation control signal."

Claim 19 "The clock and data recovery unit according to claim 1 wherein the delay locked loop..." as delay locked loop is not referred in the chain of claims so change it to "The clock and data recovery unit according to claim 1 wherein a delay locked loop..."

Claim 24 "The clock and data recovery unit according to claim 1 wherein a transition loss the detection unit..." change it to "The clock and data recovery unit according to claim 1 wherein a transition loss detection unit..."

Claim 26 "...the digital control unit further includes the lock detection unit and the transition loss detection unit." change it to "...the digital control unit further includes a lock detection unit and a transition loss detection unit."

Claim 27 "...a multiplexer for rotating the reference phase signal in response to the rotation control signal is integrated in said digital control unit." as digital control signal is never referred to in this chain of claims, following correction is required "...a multiplexer for rotating the reference phase signal in response to the rotation control signal is integrated in a digital control unit."

Claim 28 "...the equidistant reference phase signals generated by the delay locked loop..." change it to "...the equidistant reference phase signals generated by a delay locked loop..."

Claims 31, limitation (a3) "converting the oversampled data bit stream into a deserialized data stream;" change it to "converting an oversampled data bit stream into a serialized data stream;"

Claim 31, limitation (a4) "... a phase detector gain (PDG) depending on the data density (DD) of the deserialized data stream to minimize the variation of the average phase detector gain;" please change it to "... a phase detector gain (PDG) depending on a data density (DD) of the deserialized data stream to minimize the variation of an average phase detector gain;"

Claim 31, limitation (b1) "weighting data samples of the parallelised data stream around the adjusted sampling time;" change it to "weighting data samples of the deserialized data stream around the adjusted sampling time;"

Appropriate correction is required.

***Allowable Subject Matter***

5. Claims 1-31 are objected to and would be allowable if rewritten to overcome the objection, set forth in this office action and to include all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: The present invention is a clock data recovery circuit receiving serial data bit stream and comprising all the below limitations; phase adjustment circuit with, adjustment of a sampling time in the center of a unit interval of the received data bit stream, generating equidistant reference phase signals, a phase interpolation unit, oversampling unit, serial-to-parallel-conversion, binary phase detection unit, a loop filter

for filtering the detected average phase difference, data recognition means (DRM-) for recovery of the received data stream which includes a number of parallel data recognition FIR-Filters, weighting unit for weighting data samples of the serialized data stream, summing unit for summing up the weighted data samples, a comparator unit for comparing the summed up data samples with a threshold value to detect the logic value of a data bit within the received serial data bit stream.

7. The closest prior art, Rhee et al. (US 7,197,102) and Tuttle et al. (US 6,646,822) discloses a system for clock and data recovery, but fails to disclose that the phase detector comprises means for generating equidistant reference signals, a phase interpolator, binary phase detection unit, and the data recognition comprising; weighting and summing means. It would not been obvious to one of ordinary skill in the art to combine the present invention with the prior art system to make the disclosed system. The distinct features have been added to the independent claims 1, and 31. Therefore, rendering them allowable.

### ***Conclusion***

8. This application is in condition for allowance except for the following formal matters:

The abstract is objected to as fails to comply with the rules set forth in MPEP, the abstract can't contain more than 150 words or 25 lines.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 25 USPQ 74, 453 O.G. 213, (Comm'r Pat. 1935).

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hirdepal Singh whose telephone number is 571-270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off) 8:00AM-5:00PMEST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HS  
September 28, 2007



SHUWANG LIU  
SUPERVISORY PATENT EXAMINER